

REMARKS

By the present amendment and response, independent claims 1 and 14 and dependent claims 5, 12, 19, and 23 have been amended to overcome the Examiner's objections. Claims 10, 20, and 22 have been canceled and new claims 25 and 26 have been added. New claim 25 is the independent form of claim 3, which includes all of the limitations of intervening claim 2 and base claim 1. New claim 26 is the independent form of claim 18, which includes all of the limitations of base claim 14. New claims 25 and 26 are thus allowable according to the Examiner's comments on page 5 of the Office Action dated June 12, 2003. Thus, claims 1-9, 11-19, 21, and 23-26 remain in the present application and claims 25 and 26 are now in condition for allowance. Reconsideration and allowance of outstanding claims 1-9, 11-19, 21, and 23-24 in view of the following remarks are requested.

The Examiner has rejected claims 1-5, 7, 8, 10, 11, 14, 16, 18-22, and 24 under 35 USC §103(a) as being unpatentable over U.S. patent number 4,528,520 to Michitaka Osawa ("Osawa"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claims 1 and 14, is patentably distinguishable over Osawa.

The present invention, as defined by amended independent claims 1 and 14, teaches, among other things, a SiGe HBT having a collector coupled to a source of a field effect transistor and a drain of the field effect transistor directly coupled to a BiFET low noise amplifier output by a first capacitor. As disclosed in the present application,

advances in SiGe BiCMOS technology have enabled the fabrication of SiGe HBTs having low noise figures. For example, a SiGe HBT may have a noise figure less than approximately 0.6 dB. As a result, the present invention specifically utilizes the advantages of a SiGe HBT by coupling the SiGe HBT to a field effect transistor to advantageously achieve an LNA (low noise amplifier) having an overall low noise figure. Additionally, by utilizing a SiGe HBT coupled to a field effect transistor to form an LNA, the present invention advantageously achieves an LNA having high gain, high linearity, and a low noise figure at low bias current by using relatively inexpensive SiGe BiCMOS technology rather than much more expensive GaAs or InP technology.

Furthermore, the present invention utilizes a single capacitor to directly couple the drain of the field effect transistor to a BiFET LNA output. As a result, the present invention advantageously achieves an efficient coupling of the drain of the field effect transistor to the BiFET LNA output without requiring additional components.

In contrast to the present invention as defined by amended independent claims 1 and 14, Osawa does not teach, disclose, or suggest a SiGe HBT having a collector coupled to a source of a field effect transistor and a drain of the field effect transistor directly coupled to a BiFET low noise amplifier output by a first capacitor. Osawa specifically discloses a wide band amplifier comprising FET 5 having a drain terminal coupled to a network, which functions as a peaking circuit and includes inductance elements 3A and 3B, capacitor 10, and load resistor 2. See, for example, column 5, lines 21-35, and Figure 9 of Osawa. In Osawa, the values of the above elements of the

network, which is used to improve the high frequency characteristics of the wide band amplifier, are selected such that the impedance characteristic at the output side of the network has a constant resistive characteristic when viewed from the drain terminal of FET 5. See, for example, Osawa, column 5, lines 30-35. Thus, Osawa requires a network comprising two inductors and a capacitor coupled to the drain terminal of FET 5 to achieve a constant resistive impedance characteristic at the output side of the network. However, Osawa fails to teach, disclose, or suggest a drain of a field effect transistor directly coupled to a BiFET low noise amplifier output by a first capacitor. Moreover, by requiring a network comprising two inductors and a capacitor coupled to the drain terminal of FET 5 to achieve a constant resistive characteristic at the output side of the network, Osawa teaches away from directly coupling a drain of a field effect transistor to a BiFET low noise amplifier output by a first capacitor.

Additionally, Osawa discloses the collector of driving transistor 6 coupled to the source of FET 5, where driving transistor 6 comprises a high frequency bipolar transistor. See, for example, column 2, lines 5-8 and Figure 9 of Osawa. Furthermore, the general requirements of driving transistor 6 in Osawa are such that driving transistor 6 is easily available and there is a large degree of freedom for selecting it, i.e. driving transistor 6. See, for example, Osawa, column 2, lines 5-11. However, Osawa fails to teach, disclose, or suggest driving transistor 6 comprising a SiGe HBT. Moreover, Osawa, fails to teach, disclose, or suggest a motivation for requiring driving transistor 6 to be a SiGe HBT.

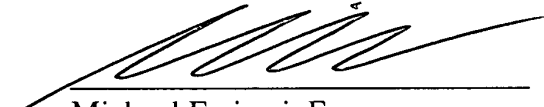
For the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claims 1 and 14, is not suggested, disclosed, or taught by Osawa. As such, the present invention, as defined by amended independent claims 1 and 14, is patentably distinguishable over Osawa. Thus claims 2-5, 7, 8, and 11 depending from amended independent claim 1 and claims 16, 18-19, 21, and 24 depending from amended independent claim 14 are, *a fortiori*, also patentably distinguishable over Osawa for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claim 23 under 35 USC §103(a) as being unpatentable over Osawa in view of U.S. patent number 4,754,233 to Michael N. Pickett. As discussed above, amended independent claim 14 is patentably distinguishable over Osawa and, as such, claim 23 depending from amended independent claim 14 is, *a fortiori*, also patentably distinguishable over Osawa for at least the reasons presented above and also for additional limitations contained in the dependent claim.

Based on the foregoing reasons, the present invention, as defined by amended independent claims 1 and 14 and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, dependent claims 2-9, 11-13, 15-19, 21, and 23-24 are also patentably distinguishable over the art cited by the Examiner. For all the foregoing reasons, an early allowance of outstanding claims 1-9, 11-19, 21, and 23-24 and an early Notice of Allowance for all claims 1-9, 11-19, 21, and 23-26 is respectfully requested.

Respectfully Submitted,
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